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Poultry Progress: What Are Good Chickens?

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Poultry Pointers
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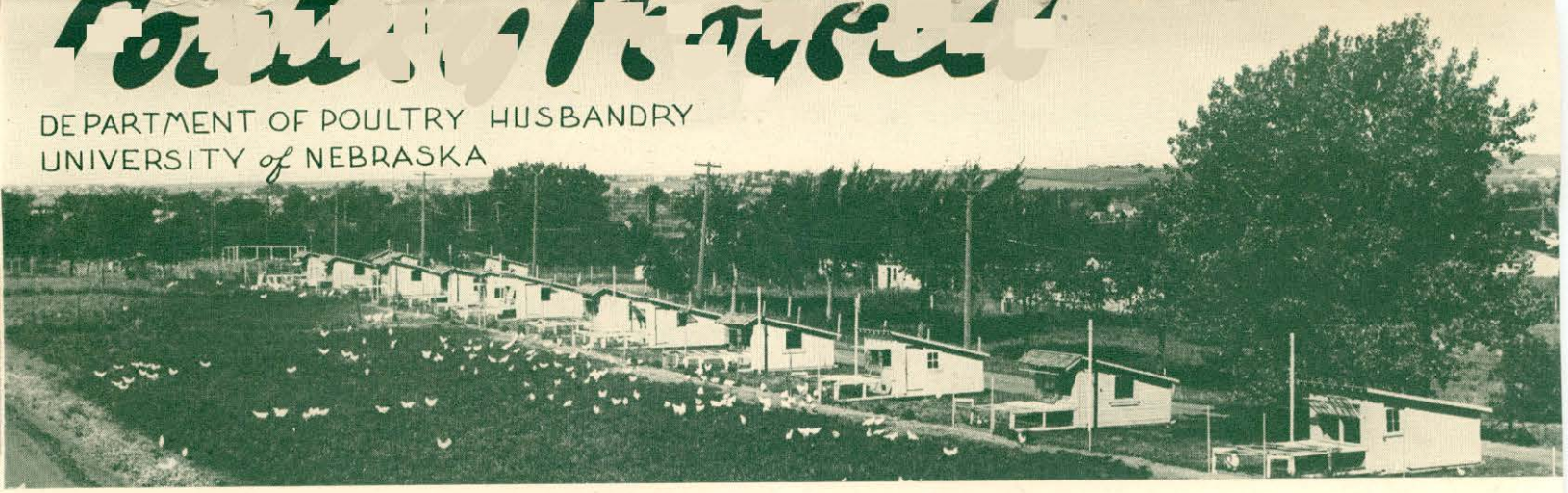

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WHAT ARE GOOD CHICKENS?

By F. E. Mussehl

The desire for improvement is one of the highest of human virtues. Folks everywhere want good chickens. The poultry business is a competitive enterprise, and it is imperative that we have the best stock possible for the particular job to be done. But what are good chickens? Is there confusion about the term? Perhaps we can clarify the picture by asking one or two questions.

What is the job to be done? The poultry business is a composite of at least a half dozen different enterprises. These may all be conducted on the same farm, but in any event each enterprise should be analyzed according to the product that is produced, so that we can better visualize the kind of stock required.

What is the most important poultry product? The answer is that about 70 per cent of Nebraska poultry income is derived from eggs. This does not mean, however, that all of our chickens should be of the strictly egg-producing breeds. Poultry meat is also very important, and under certain conditions, the production of poultry meat offers greater possibilities for a profitable investment of labor, capital, and management than does egg production.

But some folks will want to keep breeds which are particularly well adapted for egg production, and they will ask the question, "What breed will lay the most eggs?" What is a fair answer to this perennial question? Isn't it about like this? First, egg-laying enthusiasm varies greatly even among individuals of the same breed and strain, housed in the same house, and given the same ration. The most consistent phenomenon in all nature is variability. Admitting this variability, there are certain strains of chickens that have been selected persistently for good production, and the records at the egg-laying contests show that good egg-laying ability can be fixed by careful mating of the best birds of a particular strain each season for a period of years. Breeding for egg production has been carried on more persistently with some breeds than with others, and it will be easier to find good laying stock of some breeds than others. But if we persist in the right program, there is no question but that we can develop high egg-laying capacity in any strain of any breed.

How Is Egg Laying Ability Inherited?

Some of the most comprehensive research work on inheritance of egg production has been carried on by Dr. F. A. Hays, Poultry Geneticist of the Massachusetts Agricultural Experiment Station. Dr. Hays and co-workers have analyzed a large number of trapnest records, and have concluded that five characters are specifically involved in the inheritance of egg-laying ability. These characters are listed by Dr. Hays in a very instructive article in the July 1944 issue of *Poultry Science*. In applying these principles, we should bear in mind that the research work in poultry genetics

at the Massachusetts Station was carried on with Rhode Island Reds, and so the values for the maturity factor may not be quite the same as would obtain if White Leghorns or lighter breeds had been used. Here are the characters as Dr. Hays interprets them:

1. Early sexual maturity, 215 days or longer.
2. High winter intensity. Clutch size of three or more.
3. Non-pause. Winter pause shorter than eight days.
4. Non-broody for pullet year.
5. High persistency. A laying year of 280 days or more.

Table I shows the relationship of these desirable qualities to annual production in 1220 birds kept under uniform conditions.

Table I

Number of desirable characters	Number of birds	Per cent of birds	Average egg production
1	10	.82	124.90
2	69	5.66	157.39
3	393	32.21	187.96
4	439	35.98	223.89
5	309	25.33	251.60
Total birds	1220		

Table II shows the *relative* importance of the five inherited characters as measured by annual egg production.

Table II

No. of birds	Classes	Annual production	Differences
309	All five characters	251.6	Control
19	Lack early maturity	244.7	6.9
182	Lack intensity	220.2	31.4
195	Lack non-pause	227.4	24.2
20	Lack non-broodiness	234.8	16.8
23	Lack persistency	196.4	55.2

Dr. Hays summarizes his research work by the following conclusion: "The five inherited physiological characters may be rated as follows with respect to their effect on annual first year production: High persistency first, high intensity second, no winter pause third, non-broodiness fourth, and early sexual maturity fifth. Progress in combining all five desirable characters has been slow because of the complex mode of inheritance, and because of restricted flock size."

How can these principles be applied to the job of improving farm and semi-commercial poultry flocks? We doubt that it will be practical to trapnest, but we should use the skill and knowledge of the specialized poultry breeder who does use trapnests. Much of the value of trapnesting and pedigree breeding can be obtained in the purchase of 100 baby chicks or 200 hatching eggs from a breeder who has stock of the quality which is desired. It is well, however, in any breeding program to bear in mind that the *individuality* of the males used should be given high value, even above that of the pedigree. Some of the disappointments in the application of accepted breeding principles have been due to the fact that pedigree has been put first, and vigor, vitality, and individuality second. We believe that special emphasis should be placed on individuality and vigor.

A high egg record does not tell quite the whole story either, because egg size, egg shell texture, and egg shape must be considered. At the official egg-laying contests, point values for eggs are now applied with the following scale:

Egg Weight per Dozen Ounces	Points
18	0.70
19	0.75
20	0.80
21	0.85
22	0.90
23	0.95
24	1.00
25	1.05
26	1.10
over 26	1.10

Shell texture and shell shape are important, because these are important considerations in a grading program, and the trend will be for the sale of more eggs on a graded basis each year. Eggs with a good typical egg shape can be packed more easily and shipped with less loss than eggs which are abnormally long or abnormally round. Selection for good egg shape and good shell texture is possible by any breeder, although again it must be conceded that for most rapid progress in fixing these desired qualities, one should apply the principles of progeny testing.

Can We Build Poultry Health?

We can all agree that the most fundamental of all qualities for chickens is the capacity to live. A baby chick may have 20 generations of 250 egg ancestry on both sides of its pedigree, but if somewhere in its travels it has picked up pullorum infection it can hardly be called a good chick. Pullorum disease can be eradicated, as many progressive Nebraska poultry breeders can testify. In some states, less than three birds in 10,000 of the hens reserved for breeders have been found

to be infected when careful testing has been done. Pullorum can be whipped, and this job should have high priority in any program of poultry improvement.

Once having eradicated pullorum, it will be well to handle the breeding flock on a closed flock basis. By this we mean that no stock should be introduced unless we are absolutely sure that it is free from pullorum. The emphasis on this program provided by the National Poultry Improvement Plan is proper, and has proved very effective in eradicating pullorum in many flocks.

Leukosis Can Be Controlled

Another disturbing problem during recent years has been range paralysis of Leukosis. The cause and control program for this disorder has received intensive study at several Experiment Stations, and at the Federal Poultry Disease Laboratory. Although much research work still remains to be done, a control program can now be suggested based on laboratory experiments and field demonstrations.

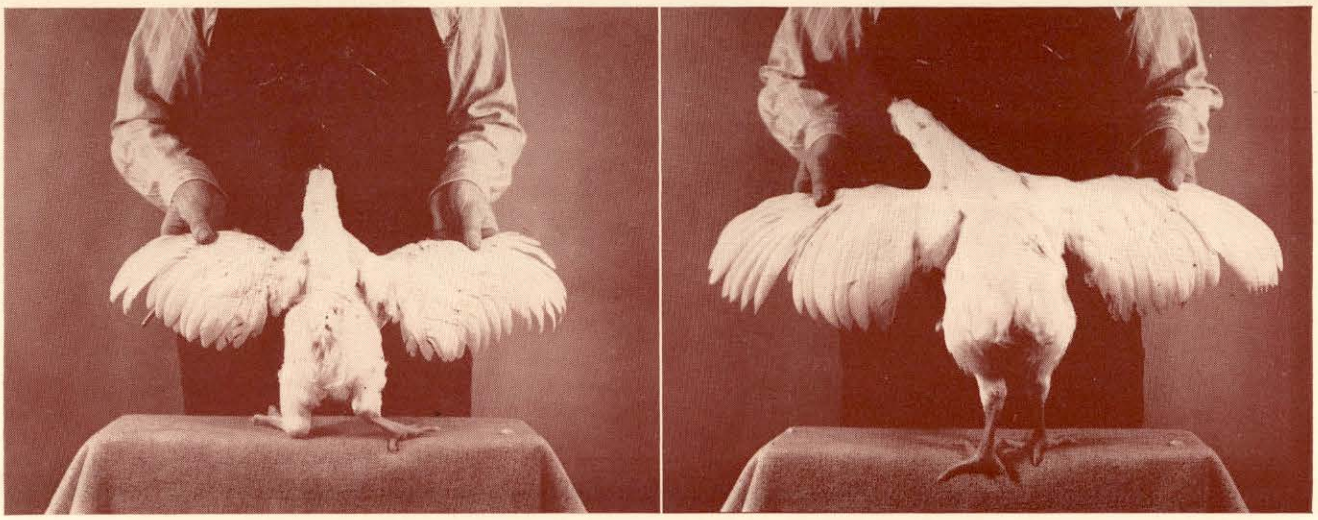
Dr. C. D. Lee of the Veterinary Research Institute at Iowa State College has directed some particularly valuable work on this problem. The conclusions which this very thorough scientist draws after several years' study: "Inheritance plays an important role in the degree of resistance and susceptibility of chickens to leukosis (range paralysis)."

In the early experiments at the Iowa Station a difference in the susceptibility of different families of the same breed was observed. Selections were made for five years on the basis of susceptibility and resistance. Seventy per cent of the birds in the susceptible strain developed leukosis, whereas the resistant group, raised under identical conditions, rarely exceeded seven per cent.

Field experiments, based on persistent culling of typical farm flocks, show that this principle is effective under farm conditions. Thirty-five flocks, totaling about 8000 birds, were observed. Before persistent removal of affected birds was started, the death loss from leukosis was 50 per cent. The first year of the program, the loss was reduced to 25 per cent, and in five years it had been reduced to seven per cent. Essentially the program followed was: *Prompt removal of all visibly affected birds with emphasis on providing clean feed, clean water and clean houses.*

D. R. Marble, formerly of the Pennsylvania Agricultural Experiment Station, has been studying the same problem for five years. His results likewise indicate that resistance to paralysis can be increased by selection. The use of rigorously culled hens for breeding, instead of pullets, was in itself very effective in reducing losses from leukosis. This is in agreement also with the observations of D. C. Kennard of the Ohio Agricultural Experiment Station.

Not all poultry disease problems can be solved by applying genetic principles, but it is agreed that persistent culling of breeding flocks is the basis of health maintenance. Successful poultry breeders cull for production. They cull also for uniformity, but, above all, they cull constantly for the *capacity to live.*



Two cockerels grown in the same house and fed the same ration. At 12 weeks bird at right weighed 3.4 pounds, and was fully feathered. Bird at left weighed 2.0 pounds, and was very poorly feathered.

Meat Production Is Important

At the present time our poultry meat consumption is about 27 pounds per person per year. Whether this can be increased will depend upon our ability to make this phase of the industry more efficient. Broiler production has become a specialized industry in certain parts of the United States. Less than two decades ago, a few poultrymen in the Del-Mar-Va area started raising broilers in single colony houses, which would accommodate 400 to 500 chicks. These growers succeeded, and the business grew so that now over 100,000,000 broilers are raised in that area in permanent houses, many of which are 1000 feet in length and a few as long as one-third of a mile. These producers have become intelligent and determined specialists. Specialists have to think things through, because if they don't, they won't stay specialists very long.

Most of these growers buy baby chicks from other specialists who have equipped themselves to produce chicks with the desired qualities. An advertisement in a recent poultry growers' yearbook summarizes these qualities as follows:

1. Chicks fully feathered at six weeks.
2. Broilers weighing three pounds at 10 weeks.
3. Pullets weighing five pounds at 5 months.
4. Exceptionally high livability.

In this particular advertisement, no mention is made of freedom from pullorum, but this is so taken for granted in that territory, that it is not even mentioned in the advertising.

In every flock of chickens, one can notice great variation in the rate of feathering, in the rate of growth, and in the fleshing quality. Persistent selection for these qualities will bring about great improvement in any strain intended to be used for meat production. Here again, for most rapid progress, the progeny-testing principle should be applied, but this will be the job of a breeding specialist. The use of fast feathering, rapid growing males is possible, however, even for farm poultry producers. The best time to mark some of the most desirable males is when they are about 12 weeks old. It will be desirable to band or mark twice as many as will be needed to mate the breeding flock, so that another rigorous selection can be made just before the flock is mated.

Eggs from pullorum-clean hens with the right selection background should produce good chicks if incubation conditions are satisfactory. Modern incubators represent the best of technological application, and the hatching job can now be done better than was ever possible with the old hen method. When good eggs are set, and the hatching job is well done, chicks will carry the qualities summarized in what we may call the eight-point yardstick. It follows:

1. Free from pullorum disease. Breeders, both females and males, should be tested. Complete eradication of pullorum requires retesting of infected flocks at 30-day intervals until all reactors are removed.
2. Vigorous—reflected in a full, bright eye, long, downy fluff, not sticky—plump—well filled shanks. How long did his grandmas and grandpas live?
3. Well healed umbilicus, indicating good yolk absorption.
4. Weight, eight pounds or more per 100 chicks at 24 hours. Chicks to weigh from 64 to 65 per cent of original egg weight.
5. Intensive pigmentation in shank and beak, indicating good nutrition during the pre-hatch period. (This applies only to chicks of the yellow shanked varieties.)
6. From stock representative of the breed and variety.
7. *For market egg production*—from stock bred for egg production. Good breeders should possess "pedigree plus" qualities.
8. *For market poultry production*—from stock selected for rapid growth rate, rapid feathering and good meat quality.